



MINISTRY OF CIVIL AVIATION

REPORT
of the Committee on Recruitment,
Training and Licensing of Personnel
for Civil Aviation and
Memorandum by the Minister
of Civil Aviation

*Presented by the Minister of Civil Aviation to Parliament
by Command of His Majesty
July 1949*

LONDON
HIS MAJESTY'S STATIONERY OFFICE
NINEPENCE NET

Cmd. 7746

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Note.—The estimated cost of the preparation of this Report is £99 17s. 6d. of which £84 10s. 0d. is the estimated cost of publishing and printing this Report.

MEMORANDUM BY THE MINISTER OF CIVIL AVIATION

In presenting this Report to Parliament it is pointed out that the Conclusions and Recommendations affect the Admiralty, Air Ministry and Ministry of Civil Aviation. The following comments, therefore, have the concurrence of the First Lord of the Admiralty and the Secretary of State for Air.

2. Since the Report was made the Royal Navy has introduced a short service scheme for naval aircrew and Recommendations 7-10 should, therefore, be read as applying equally to ex-aircrew of the Royal Navy and the Royal Air Force.

3. Recommendations 2, 6, 7, 19 and 26, and Conclusions 3 and 27 are accepted.

4. No objection is seen in principle to Recommendations 4, 20, 21, and 22 but they raise matters of management for the air operators which will be brought to their notice.

5. As regards Recommendation 5, the number of licensed engineers in civil aviation is relatively small and the privileges of their licences are supervisory, being concerned with the inspection of maintenance work and the certification of aircraft as safe for flight. Standards are exacting and the Service Departments could not provide special training without disruption of the existing trade structure. Ex-service engineers are, however, eligible for employment in an unlicensed capacity from which they may graduate to licensed posts after reaching the standards of proficiency laid down by the Air Registration Board.

6. Recommendations 8, 9 and 10 are accepted in principle and discussions are proceeding between the three Departments as to the best methods of giving effect to a system for pre-selection of aircrew.

7. From a detailed examination by the three Departments of Paragraphs 11-18 of the Conclusions and Recommendations, it appears that the figures for pilots given in Appendix E of the Report are over-stated and that there will in fact be no lack of pilots before the end of 1951. It is uncertain whether there will be any lack thereafter; the answer depends to a considerable extent on the requirements of the air charter industry. The examination that has taken place confirms the need, expressed in Recommendation 2, for the estimates of numbers of personnel required and available from Service sources to be revised at regular and frequent intervals. The questions raised by these Conclusions and Recommendations will, therefore, be kept under continuous review but, in the meantime, it cannot be accepted without further examination that aid for training of entrants from civil life should be provided from public funds.

8. As regards Recommendation 23, it is not accepted in principle that public funds should be made available to assist pilots to obtain the professional qualifications required by the licensing regulations. In the present transitional period, however, it has been agreed, with Treasury consent, that holders of "B" Licences who require to obtain either the Senior Commercial or the Airline Transport Pilots Licences or an Instrument Rating will be permitted to take the necessary examination or flying test at half the normal fees for the first attempt only.

9. Recommendation 24 will be kept under review.

PAKENHAM.

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OF PERSONNEL FOR CIVIL AVIATION

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Terms of Reference

The terms of reference of the Committee are shown at Appendix "A".

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REPORT

To the Right Honourable LORD PAKENHAM,
Minister of Civil Aviation.

MY LORD,

We have the honour to present the following report on the subjects that your predecessor referred to us for examination.

INTRODUCTION

1. Our terms of reference, issued on 22nd September, 1947, are given at Appendix A. They comprise the general problem of the provision of qualified staff to meet the future needs of civil aviation. The terms of reference are wide, and we early realised the importance attaching to our findings and recommendations. For this reason, we have resisted the temptation to assume the inevitable expansion of civil aviation as opposed to making a careful assessment of trends, and the figures quoted in this report bear a strict relationship to the statistics provided by the various competent authorities.

2. We have held 20 meetings and have sought information and expressions of opinion from 131 user organisations, including the three airline Corporations, charter companies, the Air Registration Board, organisations of skilled technical staffs, training establishments, the Ministry of Civil Aviation, the Air Ministry and the Admiralty. In addition, we have received oral evidence from 45 witnesses. These organisations and witnesses are listed in Appendices B and C.

GENERAL APPROACH

Analysis of the Problem

3. Theoretically, the examination of the problem can be divided into the three phases of recruitment, training and licensing. In practice, the recruitment and training problems proved too closely associated for separate treatment, and in this report we have dealt with them together.

Categories of Personnel Considered

4. We decided to deal only with those categories of personnel concerned directly with flying operations and requiring special aeronautical training or qualifications. With this in mind, we examined the requirements for the following :—

- (i) Pilots
- (ii) Navigators
- (iii) Radio Officers (aircrew)
- (iv) Flight Engineers
- (v) Aircraft Maintenance Engineers
- (vi) Aircraft Radio Maintenance Engineers
- (vii) Ground Radio Operators
- (viii) Air Traffic Control Officers
- (ix) Meteorological Officers

We decided that our terms of reference did not extend to personnel needed for the design and the manufacture of aircraft and equipment, or for administrative positions. The latter will usually be filled from within the business concerned, or from normal business sources.

Licences

5. Throughout this report, our comments on matters concerning licences relate to the new types of licences about to be introduced by new Regulations. Brief particulars of these licences are given at Appendix D. The most important differences between these licences and the present ones are the replacement of the present Pilot's "B" licence by three grades of professional licence, namely, the Commercial Pilot, Senior Commercial Pilot and Airline Transport Pilot: the introduction of an Instrument Rating: and the introduction of a licence for Aircraft Radio Maintenance Engineers. We understand that these new licences have been evolved after full discussion between the Ministry of Civil Aviation and the interests concerned, and that they also incorporate international agreements on these matters reached through the International Civil Aviation Organisation. In view of this, and of the fact that the evidence submitted to us contained no proposals for substantial changes in these licences, we have not considered it necessary to examine their provisions in detail.

Requirements for the Colonies

6. Hitherto, the Colonies have relied for many of their technical personnel on recruitment from the United Kingdom. Their general policy is to employ an increasing proportion of local staffs but, during the interim period while such staffs are being trained to the necessary standards, skilled personnel will continue to be recruited from the United Kingdom, although on a decreasing scale. Such estimates as could be obtained for the Colonies' requirements in the various categories have been included in the estimates used in this report.

Requirements for the Dominions

7. We have assumed that an assessment of the requirements for civil aviation personnel in the Dominions is outside the scope of our inquiry, and that any action needed in this connection will be a matter for the Dominion Governments themselves. It does not appear likely that such requirements would make any appreciable drain on trained United Kingdom personnel.

Employment of Military Reservists

8. We considered the difficulties that might arise in civil aviation if a large percentage of personnel had to be withdrawn during a national emergency or a prolonged period of tension, because of their commitments as reservists of the Armed Forces. It appeared to us that the extent to which such personnel would be recalled from civil aviation in an emergency would depend upon Government policy at the time, and that due weight would be given to the need for maintaining civil air services in the national interest. We have therefore made no recommendation on whether a limit should be placed to the proportion of military reservists that should be employed in civil aviation, on the assumption that the action to be taken in an emergency will have been agreed beforehand between the civil and military authorities concerned.

Length of Period under Review

9. We decided to consider the requirements likely to arise during the next ten years. This should allow time for recovery from the present difficulties imposed on British civil aviation by economic circumstances, and for a subsequent period of normal development.

ESTIMATE OF FUTURE REQUIREMENTS

Factors Involved

10. Our first task was to estimate the numbers of personnel likely to be needed. This proved a formidable task, because of the uncertainties in contemporary aviation and its prospects. In addition to the introduction and operation of new types of aircraft in the period under review, there are the imponderables arising from the effect on manpower requirements of new developments such as jet and turbine-propeller engines, the complex equipment required for regular flying at great speeds and high altitudes, and changes in the qualifications of personnel and composition of aircrews likely to arise from agreements reached through the International Civil Aviation Organisation. In particular, there is the uncertainty of the future economic situation of the United Kingdom, Europe, and those countries outside Europe with which the United Kingdom maintains air communications. The effect on civil aviation of current economic difficulties, particularly the restrictions on pleasure travel abroad, is apparent to all. In view of this, it was hardly surprising that many of the aeronautical concerns we approached for assistance in making such an estimate (see paragraph 2) replied that they were unable to provide any useful information.

The Basis of the Estimate

11. Nevertheless, the best estimate possible in the circumstances had to be provided before we could make an effective approach to the subject. We therefore asked user interests for estimates of their future requirements, on the assumption that the restrictions at present imposed on travel would be progressively reduced. They were asked to estimate the increased numbers of personnel they would require each year up to 1950, and from 1950 to 1957 if the information could be provided. We decided that the immediate post-war period up to 1950 would, other things being equal, show a rate of increase greater than that to be expected in a period of normal peace-time development, such as from 1950 onwards. We were assisted in obtaining this information by an inquiry that the Ministry of Civil Aviation had conducted with user interests a few months previously.

12. Having obtained users' estimates of requirements for personnel for 1948-50, we applied the results of an independent statistical study carried out by the Ministry of Civil Aviation, to extend these estimates to cover the period 1950-57. The forecast thus obtained took into account expected changes in real national income during this period, the relationship between real national income and the demand for air travel, and the different sizes and performance of the new types of aircraft that would come into service. The ratios of other categories of aircrew to pilots were calculated from information supplied by users, and account was taken of changes in the composition of aircrew to be expected during the period. The requirements for other categories of personnel were calculated from information supplied by users and from estimates of the future growth of air traffic. It is of interest that the estimates provided by some of the larger operators for the period 1950-57 were generally in accord with the estimate based on the factors described above. A summary of the estimates for different categories of personnel is given at Appendix E.

13. We should point out that the demand for pilots during the first part of 1948 has proved proportionally less than that contained in our estimate for the whole of 1948. However, we see no justification for modifying the estimate, because the inconsistency between estimated demand and actual

demand in these few months is due to difficulties that we may reasonably expect to be too ephemeral to affect the whole period. Moreover, the recent adoption of the European Reconstruction Programme should increase the demand for air transport between the participating countries—a factor that will tend to offset any temporary setback experienced at present.

Periodical Review of Requirements

14. Our estimate of requirements must be revised if circumstances should change any of the factors on which it has been based. We therefore recommend that the estimated requirements of civil aviation should be reviewed from time to time, say at yearly intervals, in order that changes may be made if necessary in both the scale and manner of implementing such recommendations as may be adopted as a result of this report. This applies particularly to our recommendations in paragraphs 33-36 and 41-44 for pre-selection and pre-release training of personnel from the R.A.F., and for State aid in the training of pilots entering civil aviation directly from civil life.

RECRUITMENT AND TRAINING

General

15. As mentioned earlier, we have found it impracticable to deal with these two phases separately in our report, since we could not consider the sources of supply without taking into account the minimum qualifications required of a candidate before he would be considered suitable as a recruit. Moreover, the age of entry into civil aviation must be comparatively low. A recruit will generally have to begin in a subordinate position, and should therefore be of an age when he is still able to adapt himself quickly to new circumstances. It will be harder for him to do this if he has previously been in a position of authority and has to change from exercising functions of which he is a master, to learning a new technique or modifying his previous one. In addition, the pensions schemes established for employees of the three airline Corporations and at least one of the larger charter companies impose an upper limit on the age of entry because of actuarial considerations.

16. Our conclusions on the manner in which requirements for new personnel in the different categories can be met are given in paragraphs 18-29 below and in the subsequent section on pilots.

Pilots

17. The most serious shortage is likely to occur in the provision of pilots. The factors involved are complicated, and we have therefore devoted a separate section to this problem.

Navigators

18. It is an increasing practice to combine the duties of first or second pilot on an aircraft with those of the navigator, and this tendency, which conduces to economy, is likely to grow with the improvement and increased provision of navigational aids. In general, Service* navigators are trained solely as such and, except possibly for certain long distance operations, they will eventually be unlikely to find openings in civil aviation without undergoing full pilot training. It will probably be more economical to train

* Note.—The word "Service" is used in this report to refer to the Royal Air Force, the Royal Navy and to a limited extent, the Army, except where the context makes it clear that only one of the Armed Forces is referred to.

ex-Service pilots to be pilot/navigators than to train ex-Service navigators to be professional pilots. In view of this, we consider that the civil aviation demand for navigators as such will eventually decrease to a point at which no special provision will be needed to maintain the supply of personnel required.

Radio Officers (aircrew)

19. At present, radio officers are needed for maintaining communication between aircraft and ground radio stations, for obtaining bearings from ground radio beacons and direction-finding stations and, on some aircraft, for operating and interpreting radar navigational aids. We consider that, with the extension of facilities for international communication by radio-telephony in the English language, the communication duties on all but the longer routes will be carried out by pilots. The requirement for the other duties will decrease as navigational aids are improved and increased and as instruments are developed for presenting the information obtained from them direct to the pilot or navigator. For these reasons we consider that, although the annual requirement for radio officers may increase up to about 1950, it will gradually decrease thereafter and no special provision will be needed for recruitment or training. The main sources of present recruitment are the Services and the Merchant Navy, and these should remain adequate.

Flight Engineers

20. With the introduction of larger aircraft and more complicated equipment, and with the development and increased application of cruising control, the number of flight engineers required annually should increase steadily. The total requirement, however, will not be large, since the number of aircraft requiring such aircrew will be relatively small. We do not think that special provision need be made for recruitment or training, since only the larger operators are likely to have any appreciable need of flight engineers, and they will have their own facilities for giving the necessary training to their engineering employees.

Aircraft Maintenance Engineers

21. Aircraft Maintenance Engineers fall conveniently, for the purposes of our examination, into three main categories, namely :—

- (a) Licensed Engineers, whose principal function is to certify that work performed on an aircraft or its equipment, either before flight or during overhaul, has been properly executed and that materials to the prescribed standards have been used.
- (b) Unlicensed Maintenance Engineers, who are responsible for engineering duties directly concerned with the maintenance or overhaul of aircraft and equipment.
- (c) Engineers employed in aircraft constructors' factories and engineers employed on major overhauls of engines and accessories not immediately required for operational purposes.

22. From the evidence we received, we decided that no serious recruitment or training problem was involved in the provision of personnel under category (c) above, but that a greater or smaller degree of specialised aeronautical engineering training would be required for personnel in categories (a) and (b). Accordingly, we devoted our inquiries in the main towards these two categories.

23. It will be seen from Appendix E that the number of aircraft maintenance engineers expected to be employed in civil aviation in 1957 is 8,190, and, assuming an annual wastage rate of 6 per cent., about 490 engineers

will be needed annually to maintain that strength, in addition to any needed for subsequent net increases. It is the view of the organisations from whom we have received evidence that there will be no difficulty in obtaining adequate numbers of recruits. We see no reason to question this view, subject to the comments we have made in paragraph 24. The main sources of recruitment are mechanics leaving the Services, the output from civil training schools, the schemes operated by certain companies for training unlicensed staffs to the required standards, and apprenticeship schemes such as that under consideration by the National Joint Council for Civil Air Transport. We do, however, consider that all firms should be encouraged to institute apprenticeship schemes.

24. In the absorption of ex-Service engineers into civil aviation, three main problems arise, namely:—

- (a) The majority of such recruits will be at least 30 years of age. Following the usual 12 year period of service, these men, although of acknowledged excellence and skill, might, if introduced at their appropriate levels in civil aviation, disturb the promotion schemes of civil firms, and might therefore attract objections from the Trade Unions. We understand, however, that discussions are proceeding between the Service Departments and the relevant Trade Unions for recognition by these Unions of certain Service trades, so that ex-Service tradesmen may be accepted into industry without difficulty and with the appropriate union cards. These discussions should be encouraged, so that the transfer of Service-trained engineers into civil aviation may be facilitated, to the benefit of all parties concerned.
- (b) Difficulties are experienced by ex-Service Maintenance Engineers in obtaining civil licences, owing to certain of the Air Registration Board's requirements for technical experience which, however necessary, discount the long Service experience and background of such personnel. It should be possible to overcome this problem by arranging, as we have suggested for aircrew (see paragraph 36), that prospective recruits for civil aviation should have facilities for obtaining their licences whilst still in the Services. Such an arrangement for R.A.F. personnel was, in fact, made by the Air Registration Board with the Air Ministry for the years covering the end of the war and the immediate postwar period, and we have been informed that it was very successful.
- (c) Applicants for licences must produce evidence of their maintenance experience. Compliance with this requirement would be greatly facilitated if engineers leaving the Services were provided with a document giving full details of their maintenance experience in the R.A.F. We recommend that the Ministry of Civil Aviation should consult the Air Ministry, the Admiralty, and the Air Registration Board to this end.

Aircraft Radio Maintenance Engineers

25. It will be seen from Appendix E that the number of radio and radar engineers expected to leave the R.A.F. this year exceeds by many times the civil requirement but that, after 1948, there is unlikely to be any appreciable supply from R.A.F. sources. We consider that, after the transition stage while these R.A.F. personnel are absorbed, the radio industry itself will provide a main source of recruitment, though it is recognised that manufacturers may be reluctant to lose their trained staffs. There should also be some recruits from skilled ex-naval ratings. In view of the smallness of the civil requirement we consider that any

deficiencies can be met by training personnel within the airline Corporations, the larger charter organisations, and the Ministry of Civil Aviation, which is responsible for ground radio and radar installations in the United Kingdom.

26. We welcome the introduction of licences for these personnel and recommend that radio engineers leaving the Services should be given assistance on the same lines as those recommended for aircraft maintenance engineers in paragraph 24 above.

Ground Radio Operators

27. We consider that the present sources of supply, namely the Services and the Merchant Navy, will be adequate, provided that post-entry training courses can be given by the Ministry of Civil Aviation and International Aeradio Ltd. when required.

Air Traffic Control Officers

28. Appendix E shows that the number of air traffic control officers in 1957 will be about 1,000. At a wastage rate of 5 per cent., the annual number to be recruited to maintain this establishment will be small. No serious problems should therefore arise for the recruitment and training of Control personnel, since nearly all civil air traffic control officers will be employed by the Ministry of Civil Aviation, which has its own recruitment and training schemes.

Meteorological Officers

29. In discussing the future demand for meteorological staff with the Meteorological Office, Air Ministry, we were informed that the additional number required to meet the needs of civil aviation would be comparatively small and that, since the initial qualifications required are academic rather than aeronautical, the demand for recruits was unlikely to conflict with the requirements for other civil aviation personnel. In view of this, we consider that no special measures need be taken by the Civil Aviation Authorities for the provision of meteorological staff.

PILOTS

General

30. It is no longer practicable for a candidate wishing to become a professional pilot to obtain the necessary minimum qualifications comparatively cheaply, and to improve his commercial value by the process of "learning while earning". The cost of training to the minimum standard practicable for employment (see paragraph 40) would be £1,200-£1,500. If this training had to be extended to the standard at present required by the airline Corporations and many charter companies (600-800 hours' experience on heavy twin or multi-engined aircraft) the cost would increase to many thousands of pounds. The expense of such training would be beyond the resources of all but a small minority of candidates. At this stage, we think it right to state that, in our view, the present experience demanded by the Corporations is based on the availability of personnel having the necessary experience as a result of the recent war. In a few years' time it is unlikely that sufficient numbers of candidates with experience on this scale will be available at the right ages, and the Corporations may, therefore, have to lower the amount of experience that they demand from their entrants. However, this need not prejudice safety if the initial training and subsequent development training of candidates are efficient and thorough.

31. As elaborated later in paragraph 39 we estimate that, within a few years, civil aviation will need more pilots than can be supplied from R.A.F. sources. We have therefore considered how to make the best use of personnel available from the R.A.F. and how the additional requirements should be met.

Use of Ex-R.A.F. Pilots

32. From the point of view of national economy the fullest use should be made of ex-R.A.F. personnel so far as is consistent with the safety and efficiency of civil aviation. By this means the nation will obtain the maximum return from its expenditure on the basic flying and navigational training given to R.A.F. pilots. It should also assist in attracting into the R.A.F. personnel who would not otherwise have taken Short Service Engagements because of the uncertainty of finding employment when these engagements ended. To provide a satisfactory procedure for the civil engagement of suitable personnel, we have recommended the establishment of a Pre-Selection Scheme and a Standing Committee as described in the following paragraphs.

Pre-Selection Scheme

33. Generally speaking, it is now a condition of employment with the airline Corporations and the charter companies that a candidate for employment as pilot shall have already obtained the necessary civil aviation licences up to the standards stipulated by the organisation concerned. The Air Ministry have expressed a readiness to consider arranging facilities for R.A.F. personnel who wish to enter civil aviation, to obtain the necessary civil licences while still in the Service, but they point out that such arrangements could only be justified if a firm offer were made that a specified number of civil aviation posts would be filled by the R.A.F. personnel concerned. The chief difficulty here is to provide a firm estimate at any given moment of the numbers of additional civil pilots likely to be required two or three years ahead. This may be less difficult for the airline Corporations, which are working to long-term development plans, but is bound to be difficult for the charter industry, which is composed of very many firms of differing sizes with differing prospects of expansion. Moreover, and as we have recently seen, all plans for development are likely to be seriously disturbed by economic factors outside the control of the industry.

34. However, such an estimate must be attempted, for if the estimate given to the Air Ministry includes no requirements at all for the charter industry, the latter may find itself seriously short of trained pilots in a few years' time. We therefore recommend that the Ministry of Civil Aviation should consult to this end with the interests concerned, either directly or by means of the Liaison Committee recommended in paragraph 36. We should add at this point that in our view civil aviation will need all the suitable ex-R.A.F. pilots it can obtain.

35. When such an estimate is available the Air Ministry should be informed through the proposed Liaison Committee of the numbers of R.A.F. personnel likely to be required. We recommend that R.A.F. personnel desiring to enter civil aviation should then be interviewed, up to the maximum number required for the vacancies concerned, and that suitable applicants should be given assurance of at least trial employment with civil firms, provided they obtain the requisite civil licences beforehand. We understand that, if this assurance can be given, the Air Ministry will be prepared to arrange facilities, so far as is practicable, for these pre-selected

individuals to obtain the qualifications required. The exact arrangements can be left for negotiation between the Ministry of Civil Aviation and the Air Ministry, apart from those appropriate to the Liaison Committee already mentioned. If practicable, the pre-selected candidates should spend part of their service in Transport Command before leaving the R.A.F.

Liaison Committee

36. We recommend that a Standing Committee be appointed to arrange for the recruitment and training for civil aviation of serving personnel who wish to enter civil aviation when they leave the R.A.F. Initially, the Committee should deal only with aircrew, but from time to time it should consider the advisability of extending the scheme to other personnel in the R.A.F. who might be suitable for employment in civil aviation. The Committee should be composed of representatives of the Ministry of Civil Aviation, the Air Ministry, the airline Corporations, the charter companies and other aviation employers when concerned. Its functions should be:—

- (i) To ascertain what proportion of civil needs can be met by personnel expected to leave the R.A.F. during each period under review, and to estimate the number of posts that can be offered to suitable R.A.F. personnel.
- (ii) To arrange, in collaboration with the Air Ministry and the employers, for the interview and selection of suitable R.A.F. candidates for civil employment. This interview should preferably take place two years before they are due to leave the R.A.F., for the reasons given in sub-paras. (iii) and (iv) below.
- (iii) To reach general agreement with the Air Ministry for selected personnel to be granted facilities for obtaining civil aviation licences before leaving the Service.
- (iv) To negotiate with the Air Ministry for selected candidates to complete their R.A.F. service, where practicable, in a Command or post in which the experience will help to fit them for civil aviation.
- (v) To review the success of the pre-selection scheme from time to time and, for this purpose, to call for reports from employers on the progress or value of ex-Service personnel and of pre-selection training.

Post-R.A.F. Training for ex-R.A.F. Personnel

37. User interests consulted on this point are unanimous that additional training is needed for ex-Service personnel entering civil aviation. The object is to acquaint them with the technique of civil operations, including passenger handling, and to instil an appreciation of the economic potentialities of their own work for commercial success or failure. We see no reason to question this, but we consider that such training will have to be given in civil aviation by the undertaking employing the individual concerned.

Use of ex-Naval Pilots

38. There is no Short Service scheme in the Royal Navy, and the usual age of pilots leaving the R.N. will therefore be too high for entry into civil aviation. This situation might change if a Short Service scheme were introduced, and means would then have to be considered for enabling naval candidates for civil posts to obtain the necessary civil licences. Special training arrangements might also be needed, since most naval aircraft are

single-engined or comparatively light "twins". The time and cost of conversion for employment as civil air transport pilots would be reduced if arrangements could be made for pre-selected naval candidates to fly with R.A.F. Transport Command. In the meantime, we do not expect that civil aviation will obtain any appreciable number of flying personnel from ex-naval sources.

Civil Trainees

39. We estimate that even when the foregoing measures have been put into effect the supply of ex-R.A.F. personnel will not suffice for civil needs. It is obviously difficult to estimate the numbers of suitable ex-R.A.F. personnel that may be available annually during a period extending as far ahead as the next ten years. Any such estimate must be highly speculative and open to drastic revision because of changes in such factors as R.A.F. recruiting and manning policy, the international situation, and the development of guided missiles to replace aircraft with human crews. This is an added reason for our recommendation in paragraph 14, that the estimated requirements for civil aviation personnel should be re-examined periodically. Our conclusion, based on discussions with the Air Ministry and on our estimate of civil needs, is that the numbers of civil pilots required annually from non-R.A.F. sources from 1951 onwards, will vary between 100 and 350, and will average about 225. If the five years 1953-57 alone are considered, the average annual requirement from non-R.A.F. sources will be about 190. (See Appendix E.)

Reasons for Shortage

40. The sources of recruitment of direct entry pilots are mainly limited by the cost of training. We do not consider that any qualifications lower than a Commercial Pilot's licence with an Instrument Rating will suffice to enable a candidate to obtain employment as a transport pilot. The estimates given to us by recognised training concerns for training to this standard vary between £1,200 and £1,500 per pupil and, even then, additional costs will be incurred if the pupil is required to obtain a type endorsement for a type of aircraft on which he has not qualified previously. Bearing in mind the conditions of service and career prospects (see paragraphs 51-55 below and also Appendix F) it seems to us unlikely that a sufficient number of parents will be able or willing to afford such training to provide the number of pilots required. Consequently, unless some assistance is given, new pilots will not be forthcoming in sufficient numbers to meet requirements.

State Scholarships for Initial Training

41. In view of the State's responsibilities for civil aviation, and of the fact that lack of sufficient pilots would cripple the maintenance and development of British air services, we see no practicable alternative to the provision by the State of financial aid for pilot training purposes. The number of trainees who should receive such aid is not easy to determine, but the present proportion of undergraduates entering Universities with scholarships or other grants provides some guidance. About 7,500 of the 18,000 entrants to British Universities and University Colleges in the autumn of 1947 were holders of such awards, granted by the State or by Local Education Authorities. The former figure does not include those availing themselves of ex-Service rehabilitation grants or of two-year courses at Training Colleges for teachers, which are temporary measures.

42. We therefore recommend that initially the State should provide scholarships for training 40 per cent. of the new pilot entrants required from civil life. The adequacy of this figure should be reviewed periodically. If

the total number of non-R.A.F. entrants required annually averages 225 (see paragraph 39) and the cost of a year's training course to the standard proposed in paragraph 40 is between £1,200 and £1,500, the maximum annual cost to the State of scholarships for 40 per cent. of the entrants required would be between £110,000 and £135,000. This estimate would be reduced if the value of a scholarship were varied according to the means of the parents, but we have made no attempt to estimate such a possible saving as this would be a matter for examination when scholarship arrangements were being planned in detail.

43. In making this recommendation we draw particular attention to the following factors :—

- (a) Unless such aid is given, British civil aviation will be seriously restricted in a few years' time ;
- (b) the expenditure will not all be additional expenditure for, if there is no State aid, the three airline Corporations will have to provide initial training themselves for at least a proportion of their recruits. In effect this would be a form of State scholarship granted to those taken on by the Corporations. In our view it should be open to an individual to obtain State aid for training through open competition rather than through choice of employer ;
- (c) the estimate of £1,200 to £1,500 for training courses may be susceptible of reduction in view of the number of pupils likely to be concerned ;
- (d) the cost of such training could further be appreciably reduced by lowering or abolishing the present tax on aviation petrol.

44. We recommend that such a training scheme should be implemented in time to produce qualified trainees by the end of 1950, by which time we think that the supply of ex-R.A.F. personnel from War and Extended Service Engagements will be exhausted and, in the absence of any State-aided scheme such as this Committee recommends, there will be a serious shortage of junior pilots.

Method of Award

45. We recommend that the method of award be evolved by the Ministry of Civil Aviation in consultation with the Ministry of Education and the air transport organisations concerned. The training required will be partly academic and partly flying, the latter being by far the more costly. We consider that it will be necessary to attract two different kinds of personnel, namely, those who wish to make their entire careers as pilots, and those who wish to obtain pilot qualifications as part of their training for a career in civil aviation that would not necessarily be pursued entirely as a pilot. In our view, any age limits imposed on candidates for scholarships should be so drawn as to take account of both categories. We think that the scholarships should not be awarded solely on the basis of academic success in a written examination. Obviously, much thought will have to be given to the drawing up of any examinations considered necessary, to medical and vocational tests, and to checks on the subsequent progress of individuals under training, in order to avoid waste of public money by training individuals found to be unsuitable.

46. We realise the possibility that an individual receiving such training may later decide to pursue a different career, with the result that the object of the training will not be achieved. However, we consider that this risk must be faced, as indeed it is with other forms of scholarships. We do not think

it practicable to oblige the young winner of a scholarship to enter into what would amount to a contract to remain in civil aviation. We are also opposed to any suggestion that winners of scholarships should be required to refund part or the whole of the costs from their subsequent earnings, and we are supported in this view by the recommendations in the McNair report of 1944, on the supply, recruitment, and training of teachers.

Training Establishments for State-aided Trainees

47. We are of the opinion that existing training establishments in the United Kingdom should be adequate for this training. We recommend that those establishments regarded as suitable by the Ministry of Civil Aviation should be officially recognised as "approved" for this purpose, and that the winners of scholarships should be free to opt for any school so approved. A secondary but important benefit that would emerge from this proposal would be the probability that pupils from countries overseas, including the Dominions and Colonies, would be attracted to these recognised schools in increasing numbers. This would help to increase overseas markets for British aircraft and aviation equipment and, incidentally, could provide an additional source of foreign currency.

Employment of Trainees

48. It will obviously be necessary to avoid a situation whereby personnel, trained at either their own or State expense, are subsequently unable to find employment in aviation. We therefore consider that, as far as practicable, such personnel should be pre-selected by employers, while under training, on the same lines as the scheme suggested for R.A.F. personnel in paragraphs 33-36 above. We realise that the assessment of future demands and the provision of firm offers of employment are much more difficult to arrange with the charter industry than with the three airline Corporations. We consider that the Ministry of Civil Aviation should consult with the British air charter industry with a view to overcoming this difficulty. It will be in the charter industry's own interest to find a solution. Otherwise it may, in a few years' time, find itself without suitable pilots.

Additional Flying Experience

49. In present circumstances even the qualifications recommended in paragraph 40 may not always suffice to make a trainee employable immediately he has finished his course because they will not authorise him to act as captain of passenger or freight aircraft that are employed on regular services or weigh more than 12,500 lb. The next senior licence that will enable him to do this—the Senior Commercial Pilot's Licence—requires an additional 500 hours' flying experience (see Appendix D). It is impracticable to provide this experience by training flights alone. The only practicable course will be for such trainees to be given as much experience as possible as second pilots in large aircraft, in addition to the duties that their qualifications will authorise them to carry out as captains of other aircraft.

50. Operators of small aircraft that do not require second pilots would not be able to give trainees co-pilot experience except at the expense of employing them as supernumerary crew members. We therefore recommend that the Ministry of Civil Aviation should consult with the airline Corporations, the charter industry and representative pilots' associations to arrange for facilities to provide additional experience where necessary. For example, it may be that, by arrangement with the Ministry of Civil Aviation, trainees could be employed for a time as co-pilots with one of the larger organisations before entering the employ of another air transport undertaking.

OTHER MATTERS AFFECTING PILOTS' CAREERS

Career Prospects

51. These are obviously relevant to the problems of recruitment. The attractive feature of a pilot's career, apart from the intrinsic attraction of piloting, is the prospect of earning a good salary at a comparatively early age (see Appendix F). The chief deterrents to recruitment are the high cost of training, the relatively early retiring age, and the general insecurity of employment outside the airline Corporations. Our recommendations on the cost of training have been given previously. The other points are dealt with below.

Age of Retirement

52. The age of retirement is about 45 and a pilot is usually compelled to retire because he can no longer comply with the strict medical standard required. This means that the flying life of a pilot, during which his remuneration can be expected to increase to a reasonably high level, is only 20-25 years. At the end of that time many retired pilots are obliged to find some other way of making a living which, even allowing for any pension they may receive, means a considerable drop in their income at a time when their family and other responsibilities may be increasing.

53. An airline pilot nearing the retiring age represents an accumulation of expensive training and valuable experience. We consider that the present circumstances in which this accumulation has to be foregone should not be accepted unquestioningly, and we recommend that careful research should be conducted to ascertain if it is practicable to extend the active flying life of a pilot considerably beyond the present retirement age without prejudicing safety. This will involve not merely ascertaining why, for example, a pilot fails to comply with a particular medical requirement, but also investigating the reasons that have brought him to that state of failure. This requires the examination of cockpit working conditions, the strain imposed by flying in regions of varying climatic difficulties and traffic densities, and the procedure that an aircraft captain has to observe on the ground between flights, which may be an additional cause of nervous strain.

Interruption to Flying Careers

54. The risk that a pilot may have his flying career terminated prematurely and unexpectedly by accident or some physical deterioration can in our view only be met by adequate insurance. We are, however, concerned with the problems facing a pilot even when he retires in the normal way and his retirement can be foreseen some time ahead. In general he is given little opportunity to adjust himself from many years' flying in the air to the requirements of ground positions, or to make the necessary mental adaptation and learn whatever new techniques are involved. A certain number of pilots can be absorbed into ground posts in aviation but many must seek other outlets. We therefore recommend that employers should be encouraged to provide pilots with opportunities to adapt themselves for a change of occupation before retirement actually takes place. We are aware that it may be difficult for charter companies to make such arrangements, and we recommend consultation to this end between the Ministry of Civil Aviation, the charter organisations, and the representative pilots' organisations.

Security of Tenure

55. We have received evidence that the delay of the airline Corporations in granting contracts, due partly to the need to await the award of the Arbitration Tribunal issued last October, has increased the feeling of instability among the large number of pilots concerned. We consider it

desirable that this state of affairs should be ended and that contracts should be issued speedily. These measures, however, will not affect pilots employed by charter organisations, for whose difficulties, such as seasonal fluctuations in demand, there seems no simple solution. In the first place, it is probably a matter for negotiation on the National Joint Council for Civil Air Transport. It affects also the British Air Line Pilots Association, the British Air Charter Association, and other charter interests. In view of the significance of security of tenure and of adequate pension schemes in attracting recruits to civil aviation, we consider that the Ministry of Civil Aviation, in discharging its responsibilities both as a Ministry and as a direct employer of aircrew, should encourage such discussions and participate as necessary when matters arise on which it can give assistance. We make additional comments on this subject, as it affects civil aviation personnel generally, in paragraph 64 below.

Training for Type Endorsements

56. Professional pilots are required to have their licences endorsed for each type of aircraft they wish to fly. The cost of qualifying for a type endorsement has been considerably increased by the new requirements that were announced in Notice to Airmen No. 374 of 1947 and brought into effect on 15th January this year. The cost of qualifying on heavy types of aircraft may now be very heavy indeed. Nevertheless we see no justification for the cost of type endorsements being borne by the State as we consider this to be an expense that is incidental to the type of operations on which the various undertakings are engaged. We think that the responsibility for enabling licence holders to obtain any type endorsements required should rest with the employer. Insofar as conversion training may be required for type endorsements, we are satisfied that adequate facilities are already available.

Requalification from Existing Licences to the New Licence Requirements

57. We have considered whether pilots employed by the independent operators should be given State assistance to obtain the additional qualifications, particularly the Instrument Rating, required under the new licence regulations shortly to be introduced. (See Appendix D.) The Instrument Rating is essential to enable all professional transport pilots, and possibly also test pilots, to follow their employment. Moreover, the additional qualifications demanded by the new regulations are not specialised qualifications but a normal requirement introduced in the interests of increased safety.

58. We are impressed by the disparity between the position of the airline Corporation pilots, who will obtain at their employers' expense any additional qualifications required, and that of non-Corporation pilots, whose employers may be unwilling or unable to grant the requisite facilities. The additional costs that will have to be borne by the independent operators or their employees may be considerable, particularly in those companies using small aircraft that do not usually carry a second pilot. It may happen, therefore, that many companies and pilots will be forced out of business or employment, to the ultimate detriment of British civil aviation. Furthermore, the greatest financial burden of all will probably fall upon the temporarily unemployed pilot who will be least able to afford the expenditure required before he can reasonably hope to be re-employed. Another factor of significance from the national point of view is the importance of maintaining as many pilots as possible in active flying practice.

59. We understand that an appreciable period will elapse before the new requirements become mandatory, and consequently it may well be that during this period most pilots or their employers will find means

of overcoming the problem without assistance from the State. We consider, however, that if a situation develops in which persons employed as professional pilots are unable, for financial reasons, to obtain the additional qualifications, particularly the Instrument Rating, required to enable them to follow their employment, assistance should be afforded by the Government. Clearly, any such scheme of assistance would have to be carefully formulated and administered to prevent abuse. Many complicated questions would arise, and this measure should only be introduced if the circumstances prove to be exceptional. We recommend that the situation be kept under review and discussed from time to time with representatives of the pilots' and employers' organisations.

Maintenance of Flying Experience among Unemployed Pilots

60. The civil pilot who is unemployed for more than a few months faces a particular difficulty, because by regulation he is required to carry out a minimum amount of flying in the six months prior to the renewal of his licence. The minimum flying required will be increased when the Instrument Rating is introduced, because pilots will then have to remain sufficiently proficient to pass an instrument-flying test every six months. The cost of the flying practice needed will be appreciable and unemployed pilots will probably have to meet this expense at a time when they can least afford it.

61. In these circumstances pilots who are unemployed for more than about six months will probably be unable to afford to keep their licences and Instrument Ratings current, and will be obliged to turn from civil aviation and seek another career. The loss of such pilots on an appreciable scale would be a serious blow to civil aviation for, as we have shown in Appendix E, we believe that the numbers of pilots required will steadily increase. Moreover, pilots who are redundant because of a temporary surplus in one year, may be badly needed in the next, and if they are no longer available, new recruits will have to be trained *ab initio* at great expense and with some delay in supply.

62. It has been suggested to us that this difficulty of maintaining proficiency on transport aircraft could be largely overcome if the Royal Air Force Volunteer Reserve included some provision for transport pilots, possibly as a transport and communication section. Pilots joining the R.A.F.V.R. could then hope to maintain their proficiency by flying military transport aircraft, which are often similar to civil types, and at the same time would be contributing to the national defence resources. It is also possible that such a scheme could meet the requirements for giving additional training to State-aided trainees (see paragraphs 49 and 50) and for meeting the difficulty over the Instrument Rating qualifications dealt with by us in paragraphs 57-59.

63. We realise that the practicability of this suggestion must depend largely on R.A.F. requirements. Its advantages to civil aviation, however, and possibly to the R.A.F., would be very considerable, and we therefore recommend that the Ministry of Civil Aviation should consult with the Air Ministry regarding the practicability of establishing such a scheme.

CAREER PROSPECTS IN CIVIL AVIATION

64. In addition to our examination in paragraphs 51-63 of the special problems confronting pilots, we have examined the career prospects of other personnel employed in civil aviation within the categories listed in paragraph 4 above. The main constituents of a satisfactory career are security of tenure, adequate remuneration, the possibilities of advancement

to higher technical or administrative posts, and reasonable pension rights. In general, security of tenure is closely related to the advancement of civil aviation as a whole. Although civil aviation is passing through a difficult phase at present—and there has been a small measure of redundancy in certain categories—almost all the evidence that we have received has been to the effect that this is a temporary phase. Sober confidence has been evinced in the steady development and expansion of civil aviation from about 1950 onwards, always assuming stable economic conditions. The problem of seasonal fluctuations in demand may always be present in some charter operations, but on the whole we see no reason why prospects of steady employment and security of tenure should not continue to improve materially.

65. We have sought factual information regarding present rates of pay, possibilities of advancement, and pension rights. The results of our enquiries are contained in Appendix F, and we wish to record our indebtedness to the several employers, staff associations and trades unions that have assisted us with information. In the light of the information contained in Appendix F, we consider that the emoluments in civil aviation are on the whole satisfactory in comparison with those of other industries. We are reinforced in this opinion by the assurances we have received from the employee associations that the career prospects are in general satisfactory and that adequate machinery exists through the medium of the National Joint Council for Civil Air Transport for rectifying any defects that may exist or may arise in the future. We have not investigated the career prospects of air traffic control officers, ground radio operators and radio mechanics employed by the Ministry of Civil Aviation as we were informed that this was outside our terms of reference.

Booklet on Careers in Civil Aviation

66. We recommend that the Ministry of Civil Aviation should prepare a booklet on careers in civil aviation, in consultation with the National Joint Council for Civil Air Transport and other organisations concerned. The booklet should aim at providing parents and young people with full information on the pay and conditions of employment in the various categories, the prospects of advancement, and the methods of entry, such as the engineering apprenticeship schemes and the State-aided scheme for training pilots. It should be periodically reviewed and kept up-to-date, and should be sent to all educational establishments and other places where advice is given on the choice of careers.

LICENSING

Present Procedure

67. We have received no evidence of serious defects in the present examining and licensing procedure. We think it right to record that the evidence we have received has expressed appreciation of the co-operative attitude of the Ministry of Civil Aviation in the discharge of its examining duties. Some representations were made that more examinations should be held in places outside London to meet the convenience of candidates, but we were informed by witnesses from the Ministry of Civil Aviation that this has already been done and that additional arrangements can be made whenever the demand is sufficient.

Medical Examinations

68. We have received representations that it is undesirable for medical examinations required for professional pilots' licences to be carried out by medical officers of the Royal Air Force. We understand that the Ministry

of Civil Aviation is now considering the establishment of a Civil Aviation Medical Organisation that will enable pilots to be medically examined by civilian doctors at certain civil aerodromes chosen for their general importance and geographical convenience. We support such a scheme but have not thought ourselves justified in carrying out a detailed examination of a matter which the Ministry apparently already has in hand.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

69. The following is a summary of our main conclusions and recommendations :—

Numbers of personnel required for civil aviation

(1) We decided to consider the requirements likely to arise during the next ten years. (Paragraph 9.)

(2) Estimates of the numbers of personnel required for civil aviation should be revised at regular and frequent intervals. (Paragraph 14.)

(3) With the exception of pilots, no special measures will be required to attract and train the requisite number of recruits for civil aviation. (Paragraphs 18-29.)

Aircraft maintenance engineers and aircraft radio maintenance engineers

(4) The introduction of Apprenticeship Schemes for Aircraft Maintenance Engineers and Aircraft Radio Maintenance Engineers should be encouraged. (Paragraphs 23 and 26.)

(5) Prospective Service recruits for civil aviation should be given facilities to obtain the appropriate civil aviation licences while still in the Services. (Paragraph 24 (b).)

(6) Aircraft Engineers leaving the Services should be given certificates of their Service maintenance experience. (Paragraph 24 (c).)

Ex-R.A.F. aircrew

(7) The fullest use should be made of ex-R.A.F. pilots for employment in civil aviation. (Paragraph 32.)

(8) R.A.F. aircrew intending to enter civil aviation should be pre-selected, and suitable applicants should be given an assurance of at least trial employment with civil firms, provided they obtain the requisite licences beforehand. (Paragraph 35.)

(9) A Liaison Committee should be appointed to pre-select aircrew for civil aviation employment. (Paragraph 36.)

(10) Pre-selected aircrew should be granted facilities for obtaining civil aviation licences before leaving the Services, and should, when practicable, complete their service in posts that will help to fit them for civil aviation. (Paragraph 36.)

Entrants from civil life

(11) From 1951 onwards, an average of 225 new civil pilots will be required annually from non-R.A.F. sources. (Paragraph 39.)

(12) A Commercial Pilot's licence with an Instrument Rating is the lowest qualification that will suffice to enable a candidate to obtain employment as a [transport] pilot. (Paragraph 40.)

(13) The training of a professional pilot is expensive, and unless State aid is given there will be a serious shortage of trained pilots in a few years' time. (Paragraph 40.)

(14) A limited number of State Scholarships should be provided for the training of prospective professional pilots to the standard of the new Commercial Pilot's licence with an Instrument Rating. (Paragraph 42.)

(15) The maximum annual cost of the State-aided training scheme recommended by the Committee will be between £110,000 and £135,000. (Paragraph 42.)

(16) No contract or repayment should be required of Scholarship-holders. (Paragraph 46.)

(17) Scholarships should be tenable at any school "approved" by the Ministry of Civil Aviation. (Paragraph 47.)

(18) The only practicable means of providing further flying experience for trainees is by employment as second pilot on large aircraft. The Ministry of Civil Aviation should endeavour to arrange for facilities to provide such experience, where necessary. (Paragraphs 49 and 50.)

Other matters affecting pilots' careers

(19) The possibility of extending the active flying lives of pilots should be investigated. (Paragraph 53.)

(20) Pilots nearing the end of their active flying careers should be given opportunities to adapt themselves for jobs on the ground. (Paragraph 54.)

(21) Contracts of Service for all aircrew personnel should be issued without further delay. (Paragraph 55.)

(22) The responsibility for enabling licence holders to obtain type endorsements should rest with the employer. (Paragraph 56.)

(23) In certain circumstances, professional pilots should be given State assistance to obtain the new licence qualifications. (Paragraph 59.)

(24) The Air Ministry should be consulted regarding the possibility of assisting unemployed civil pilots to maintain their licences by flying with a Transport and Communication Section of the R.A.F.V.R. (Paragraph 62.)

Civil aviation careers

(25) Career prospects and emoluments in civil aviation are in general satisfactory, and adequate negotiating machinery exists in the National Joint Council for Civil Air Transport. (Paragraphs 64 and 65.)

(26) A booklet should be published giving details of career prospects and means of entry into civil aviation. (Paragraph 66.)

Licensing procedure

(27) There are no serious defects in the present licensing and examining procedure, and suggestions that examinations should be held in the provinces and that civil pilots should be medically examined by civilian doctors are already being acted upon by the Ministry of Civil Aviation. (Paragraphs 67 and 68.)

ACKNOWLEDGEMENTS

70. We wish to thank all those persons and organisations who have supplied us with information and expressions of opinion on the subject of our inquiry. The generous and co-operative spirit in which this assistance was given has been especially welcome.

71. The Secretariat has worked under great pressure to obtain, assess and collate the mass of information required by the Committee. Mr. Stallibrass and Mr. Cochran have been invaluable, and indeed it is due to them and to Miss Watson, their assistant, that this report is rendered without undue delay. We wish to place on record our deep appreciation of their services.

(Signed) C. A. B. WILCOCK (*Chairman*).

W. HELMORE (*Vice-Chairman*).

H. G. BRACKLEY.

E. T. F. CROWE.

LESLIE GAMAGE.

R. C. HOCKEY.

J. W. G. JAMES.

R. L. JAMES.

MILVERTON.

EUSTACE R. PULBROOK.

J. ROLAND ROBINSON.

MILES THOMAS.

OLIVER COCHRAN
G. W. STALLIBRASS } *Joint Secretaries.*

8th June, 1948.

APPENDIX A

TERMS OF REFERENCE OF THE COMMITTEE

- (i) To review the present arrangements (including the procedure for medical examination) for the issue of personnel licences in Civil Aviation and to make recommendations for such modifications as may be deemed desirable, taking into account the new categories of licences and tests that are in immediate prospect;
- (ii) to consider and make recommendations with regard to the steps which should be taken to ensure that an adequate flow of aircrew and ground personnel of the different essential categories will be available in the increasing numbers needed (whether for scheduled services, charter work or private activities or for ground work) as civil air transport develops;
- (iii) to compare the standards required of aircrew and ground personnel for Service and Civil Aviation purposes and to make recommendations with a view to enabling competent personnel of all categories to be available for Civil Aviation from Service sources after as little additional training as possible;
- (iv) to consider and make recommendations with regard to the education, recruitment and training of personnel recruited from sources other than the Services, with a view to balancing the numbers of the latter as may be necessary for Civil Air Transport;
- (v) to advise generally on the measures necessary and appropriate to meet the probable needs of personnel for British civil aviation, whilst equally ensuring that such employment shall offer reasonable careers.

APPENDIX B

LIST OF ORGANISATIONS FROM WHICH EVIDENCE WAS SOUGHT

(* *Indicates those organisations from which a statement and/or estimate was received*)

- *Admiralty
- African Air Cars
- *Air Contractors, Ltd.
- *Air Couriers, Ltd.
- *Aircraft (Hereford) Ltd.
- Air Enterprises, Ltd.
- Air Freight, Ltd.
- *Air Ministry
- *Air Registration Board
- *Air Schools, Ltd.
- *Air Service Training, Ltd.
- *Air Taxis (Croydon), Ltd.
- Air Transport College, Ltd.
- *Air Tutors
- *Airways Training, Ltd.
- *Airwork, Ltd.
- *Amalgamated Engineering Union
- *Association of British Aero Clubs, Ltd.
- *Association of Supervisory Staffs, Executives and Technicians
- *Birkett Air Service, Ltd.
- *Bond Air Services, Ltd.
- *Brevet Flying Club, Ltd.
- *British Aeronautical Navigational Correspondence School, Ltd.
- *British Air Charter Association, Ltd.†
- *British Air Line Pilots' Association
- *British-American Air Services, Ltd.
- *British and Continental Air Charter and Freight, Ltd.
- *British Aviation Services, Ltd.
- *British European Airways Corporation
- *British Institute of Engineering Technology
- *British Gliding Association
- British Nederland Air Services, Ltd.
- *British Overseas Airways Corporation
- *British South American Airways Corporation
- *Cecil Kay (Aircraft), Ltd.
- *College of Aeronautical Engineering
- *College of Aeronautics
- *Colonial Office
- Continental Deliveries, Ltd.
- De Havilland Aeronautical Technical School
- Dennis Aviation, Ltd.
- *Giro Aviation Company, Ltd.
- *Golden Eagle Marine and Air Transport
- Grayson Air Services, Ltd.
- *Guild of Air Pilots and Air Navigators of the British Empire
- *Hastings School of Air Navigation
- *Helliwells, Ltd.
- *Herts and Essex Aviation, Ltd.
- *International Aeradio, Ltd.
- International Airways
- *International Correspondence Schools, Ltd.
- Island Air Services
- *Kearsley Airways, Ltd.
- Lockwood's Flying Services, Ltd.
- *London Aero and Motor Services, Ltd.
- *L.C.C. School of Engineering and Navigation
- *London School of Air Navigation, Ltd.
- *Loughborough College
- *Magic Carpets, Ltd.
- *Marshall's Flying School, Ltd.
- McDonald Aircraft, Ltd.
- *Merchant Venturers Technical College
- *Meteorological Office, Air Ministry
- *Ministry of Civil Aviation
- *National Joint Council for Civil Air Transport
- *National Institute of Engineering
- *Navigators and Engineer Officers' Union
- Newman Aircraft Company
- *Patrick-Duval Aviation, Ltd.
- Patrick Laing Air Services, Ltd.
- Payloads Charter, Ltd.
- Raceways, Ltd.
- *Radio Officers' Union
- Reid and Sigrist, Ltd.
- *Royal Aero Club
- *School of Navigation, University College, Southampton
- *Skyways, Ltd.
- *Society of British Aircraft Constructors, Ltd.
- *Society of Licensed Aircraft Engineers
- *Solar Air Services, Ltd.
- *Somerton Airways, Ltd.
- Southampton Air Services, Ltd.
- *St. Christopher Travelways, Ltd.
- *Straight Aviation Training, Ltd.
- *Technological Institute of Great Britain
- *Thorne Aviation
- Tradewinds, Ltd.
- *Ultra Light Aircraft Association
- *West London Aero Club
- Wilts School of Flying
- *World Air Freight, Ltd.
- *Yorkshire Aeroplane Club

† See note on page 22.

NOTE.—The following companies, which were members of the British Air Charter Association Ltd., at the time of the enquiry, were approached through that Association. Replies were received from those marked with an asterisk.

- Air Charter, Ltd.
- Air Kruse (Kent), Ltd.
- *Air Links, Ltd.
- Air Transport Association, Ltd.
- *Air Transport Charter (C.I.), Ltd.
- *Astral Aviation, Ltd.
- Blue Line Airways
- British Air Transport, Ltd.
- *Brookland Aviation, Ltd.
- *Cambrian Air Services, Ltd.
- *Chartair, Ltd.
- C.L. Air Surveys, Ltd.
- Congo Charter, Ltd.
- *Culliford Air Lines, Ltd.
- *East Anglian Flying Services, Ltd.
- Hornton Airways, Ltd.
- Hunting Air Travel, Ltd.
- *Island Air Charters, Ltd.
- *Kenning Aviation, Ltd.
- *Lancashire Aircraft Corporation, Ltd.
- Loxhams Flying Services, Ltd.
- *Manx Air Charters, Ltd.
- *Morton Air Services, Ltd.
- *North Sea Air Transport, Ltd.
- *Olley Air Service, Ltd.
- Private Air Hire Service, Ltd.
- Pullman Airways, Ltd.
- *Rochester Air Charter Service
- *Scottish Aviation, Ltd.
- Silver City Airways, Ltd.
- *Sivewright Airways, Ltd.
- Steiners Air and Travel Services, Ltd.
- *Straight Corporation, Ltd.
- Transcontinental Air Services, Ltd.
- *Tyne Taxis, Ltd.
- *Ulster Aviation, Ltd.
- Universal Flying Services, Ltd.
- *Westminster Airways, Ltd.
- Weston, Ltd.

APPENDIX C

LIST OF WITNESSES FROM WHOM ORAL EVIDENCE WAS RECEIVED

<i>Representing</i>	
Captain A. W. Laybourne, C.B.E., R.N., Deputy Director of Welfare and Service Conditions.	Admiralty.
Commander G. N. P. Stringer, R.N., Directorate of Naval Air Organisation and Training.	Air Ministry.
Air Vice-Marshal J. W. Baker, C.B., M.C., D.F.C., Director-General of Planning 1.	Air Ministry.
Mr. H. P. Grabaskey, O.B.E., Assistant Director of Manning (Statistics).	Air Registration Board.
Wing Commander A. J. Shelfoon, A.F.C., Training Flying, 1.	Air Service Training, Ltd.
Mr. R. E. Hardingham, O.B.E., A.F.R.Ae.S., Chief Executive and Secretary.	Air Service Training, Ltd.
Mr. J. H. Spaul, Senior Surveyor (Licensing).	Airways Training, Ltd.
Wing Commander H. F. Jenkins, O.B.E., Chief Instructor and General Manager of the Training Department.	Airways Training, Ltd.
Mr. N. Luke, A.R.Ae.S., M.L.S.A.E., Chief Engineering Instructor.	Association of British Aero Clubs, Ltd.
Wing Commander A. H. Measures, C.B.E., Chairman.	Association of Supervisory Staffs, Executives and Technicians.
Air Commodore H. A. Fenton, C.B.E., D.S.O., D.F.C., General Manager.	British Air Line Pilots' Association.
Captain G. A. Clift, Chief Flying Instructor.	British European Airways Corporation.
Mr. J. H. Clough-Smith, Chief Navigation Instructor.	British Overseas Airways Corporation.
Wing Commander M. D. Day, Chief Engineer.	British South American Airways Corporation.
Dr. J. E. Gabb, Medical Officer.	Guild of Air Pilots and Air Navigators of the British Empire.
Mr. W. D. Kemp, Secretary.	
Mr. W. J. Paul, Chief Accountant.	
Mr. G. Willis, Chief Radio Instructor.	
Mr. G. H. M. Miles, Vice-Chairman of the Association, and Chairman of the Technical Committee.	
Wing Commander W. L. Gordon, Member of the Technical Committee.	
Mr. W. Rowe, National Organiser.	
Mr. D. Follows, B.A., Secretary.	
Captain P. E. Bressey.	
Mr. P. Stevens, Aircrew Manager.	
Mr. A. R. O. McMillan, O.B.E., Assistant Technical Director (Training).	
Mr. F. H. Pearn, Superintendent of Engineering Organisation.	
Mr. C. W. Cudemore, M.C., D.F.C., Deputy Superintendent of Operational Organisation.	
Captain D. A. Cracknell, D.S.O., D.F.C., Senior Captain.	
Group Captain W. N. Cumming, O.B.E., D.F.C., Warden of the Guild.	
Mr. I. L. S. McNicol, Secretary-General.	

Mr. W. W. Simpson, Head of Personnel and Miscellaneous Flying Division.	Ministry of Civil Aviation
Group Captain J. B. Veal, A.F.C., Director of Air Safety and Training.	
Mr. W. E. B. Griffiths, O.B.E., Deputy Director of Navigation.	
Group Captain P. Jones, A.M.I.E.E., Assistant Director of Telecommunications (Staffing).	
Mr. A. E. Hilton, Directorate of Telecommunications.	
Group Captain J. Hutchieson, M.B., B.Ch., D.P.H., Chief Medical Officer.	
Mr. A. H. Watson, Economics Division.	
Colonel R. L. Preston, C.B.E., Secretary-General.	
Mrs. A. C. Douglas, British Gliding Association.	Royal Aero Club.
Mr. D. E. de la Hoyde, Manager of the Aviation and Air Touring Department.	
Captain G. W. Wakeford, F.R.A.S., A.I.N.A., F.R.S.A., M.I.N., Director.	
Wing Commander W. J. V. Branch, O.B.E., Head of Senior Department.	School of Navigation, University College, Southampton.
Squadron Leader C. W. Roberts, R.A.F.V.R., Chief Air Navigation Officer.	
Mr. D. W. Richardson, Chairman of the Educational Panel.	
Mr. E. C. Rogers, General Secretary.	Society of Licensed Aircraft Engineers.

APPENDIX D

SUMMARY OF REQUIREMENTS FOR NEW PERSONNEL LICENCES TO BE INTRODUCED ON 1ST OCTOBER, 1948, OR ON LATER DATES TO BE ANNOUNCED

Licence	Requirements	Privileges
Student Pilot, Age 17.	<i>Pilots (Flying Machines)</i> Medical examination only.	To fly under instruction as pilot-in-charge of flying machines within the United Kingdom.
Private Pilot, Age 17.	40 hours dual or solo flying (30 hours for graduate of an approved course) at least 15 hours being as pilot-in-charge. Technical examination in navigation, meteorology, air law, flight theory and aircraft operation. Class and group rating, and (for aircraft of over 12,500 lb. gross weight) a type rating. Instrument Rating for flight under Instrument Flight Rules (I.F.R.). Night rating required for carriage of passengers at night. Medical examination.	To fly as pilot-in-charge of any private flying machine according to aircraft rating.
Commercial Pilot, Age 18.	200 hours piloting experience (150 hours for graduate of an approved course) including (a) 100 hours as pilot-in-charge, this to include 10 hours night flying and 10 hours in 6 months preceding application; (b) 10 hours dual instruction in instrument flying. Technical examination and flight tests to present 'B' Licence standard, but including flight operation and visual Morse reception. Medical examination.	As pilot-in-charge limited to aircraft not exceeding 12,500 lb. gross weight and to non-scheduled operations; holder may fly as co-pilot on any aircraft or as pilot-in-charge of "aerial work" aircraft, subject to type rating.
Senior Commercial Pilot, Age 21.	700 hours piloting experience, including 200 hours as pilot-in-charge, of which 25 hours must be night flying and 10 hours in six months preceding application. Instrument Rating. Technical examination to standard of present 2nd Class Navigator's Licence, and including flight operation. Flight test if no lower professional licence held or no recent Service flying. Medical examination.	As pilot-in-charge, limited to aircraft not exceeding 30,000 lb. gross weight without passengers, or 15,000 lb. with passengers; holder may fly as co-pilot on any aircraft or as pilot-in-charge of "aerial work" aircraft, subject to type rating.
Airline Transport Pilot, Age 21.	1,200 hours piloting experience, including (a) 100 hours night flying; (b) 250 hours pilot-in-charge, with 25 hours night flying and 10 hours in six months preceding application; (c) 75 hours instrument flying (maximum 25 hours on Link Trainer). Instrument Rating. Technical examination to standard of present 1st Class Navigator's Licence in meteorology and flight operation. Other subjects to "2nd N." standard. Flight test if no lower professional licence held or no recent Service flying. Medical examination.	As pilot-in-charge of any aircraft, subject to type rating.
Instrument Rating	150 hours as pilot-in-charge. Technical examination to 'B' Licence standard plus radio aids as required for rating. Link Trainer and flight test. 40 hours instrument flying (30 hours for graduate of approved course) and including not more than 20 hours on Link Trainer.	An instrument rating is required for all flights under Instrument Flight Rules. It is valid only if holder has passed an instrument flying test in preceding 6 months (12 months for flight as co-pilot).

Licence	Requirements	Privileges
Flight Navigator, Cadet Class. Age 18.	<p style="text-align: center;"><i>Navigators</i></p> <p>Medical examination. Evidence that licence is required to obtain navigational training in flight.</p>	To obtain training in navigational duties in flight, under supervision of Flight Navigator. To act as Flight Navigator on any aircraft.
Flight Navigator, Age 21.	<p>200 hours cross-country flying as navigator, of which 50 hours during year preceding application, and 50 hours of total at night. At least 25 celestial observations to have been made during flight by day and at least 25 by night, such observations to have been applied to the navigation of the aircraft. Ground Tests to prescribed syllabus.</p>	
(i) (a) General Flight Radio-Telephony Operator (Temporary). Age 17.	<p style="text-align: center;"><i>Flight Radio Operators</i></p> <p>Must be British subject. Technical examination. Medical examination.</p>	To operate radio-telephony apparatus on public transport aircraft under supervision of holder of full licence. See i (b) and ii (b).
(b) General Flight Radio-Telephony Operator. Age 18.	<p>Must be British subject. Must hold Temporary Licence, and produce evidence that he has performed in flight the duties of a Temporary Flight Radio-Telephony operator.</p>	To operate radio-telephony apparatus on any aircraft.
(ii) (a) First Class Flight Radio-Telegraphy Operator (Temporary). Age 18.	<p>Must be British subject. Technical examination. Medical examination.</p>	To operate radio-telegraphy or radio-telephony apparatus on any aircraft under supervision of holder of full licence (see ii (b)).
(b) First Class Radio-Telegraphy Operator. Age 20.	<p>Must be British subject. Must hold Temporary Licence and have had 2 years' approved manual radio - telegraphy operating experience in the aeronautical or marine mobile radio services, reasonably recent and at least 4 months within the year preceding application. 25 hours in flight under Temporary Licence in previous year. Technical examination in special radio-communication or radio-navigation systems.</p>	To operate radio apparatus on any aircraft.
Flight Engineer, Cadet Class. Age 20.	<p style="text-align: center;"><i>Flight Engineers</i></p> <p>Medical examination. Evidence that licence is required to obtain training in engineering duties in flight.</p>	To obtain training in engineering duties in flight, under supervision of Flight Engineer.
Flight Engineer, Age 21.	<p>50 hours flight engineer duties on type in previous year. A.R.B. Technical examination. Flight test of competency in emergency duties.</p>	To act as flight engineer on any aircraft according to rating.
(a) Instructor (Flying Machines).	<p style="text-align: center;"><i>Instructors' Endorsements</i></p> <p>Current professional pilot's licence. 400 hours as pilot-in-charge. 100 hours instructional experience. Graduate of approved instructor's course. Oral examination and flight test by G.A.P.A.N.</p>	Limited to types specified in pilot's licence for flight as pilot-in-charge.

Licence	Requirements	Privileges
(b) Assistant Instructor (Flying Machines).	Current pilot's licence. 100 hours as pilot-in-charge. Graduate of approved instructor's course. Oral examination and flight test by G.A.P.A.N.	To instruct under direction of competent Instructor. Not permitted to give pupil directions for first solo or first solo cross-country flight.
(c) Glider Instructor (Trailing Gliders).	100 hours as pilot-in-charge of aircraft, of which 30 hours, including 80 landings, as pilot-in-charge on gliders, and 25 hours as pilot-in-charge of aircraft, including 5 flights when a glider was towed and released. Oral examination and flight test by G.A.P.A.N.	To instruct in flying gliders over 1,250 lb. gross weight towed by flying machines.
Aircraft Radio Maintenance Engineer. Age 21.	<p><i>Aircraft Radio Maintenance Engineer</i></p> <p>Technical examination. 3 years' maintenance and repair experience (reasonably recent) on aircraft radio equipment. 10 hours in flight on board radio-equipped aircraft.</p>	To overhaul and repair radio apparatus in public transport aircraft according to type endorsement.
Private Pilot. Age 16.	<p><i>Glider Pilots</i></p> <p>3 hours in free flight, of which 2 hours as pilot-in-charge, and including at least 20 take-offs and landings. Flight test, including cross-country flight of 30 miles. Technical examination.</p>	As pilot-in-charge of any private glider under 1,250 lb. gross weight or heavier type specified in licence.
Commercial Pilot (Soaring Gliders). Age 19.	50 hours as pilot-in-charge (free flight) and 3 hours in year preceding application. Flight test. Technical examination.	As pilot-in-charge of any glider under 1,250 lb. gross weight or heavier type specified in licence. As pilot-in-charge of any commercial glider over 1,250 lb. gross weight of a type specified in the licence.
Commercial Pilot (Trailing Gliders). Age 19.	200 hours piloting experience in aircraft (150 hours for graduate of an approved course), of which at least 100 hours, as pilot-in-charge, of which 30 hours as pilot-in-charge of gliders (10 hours in six months preceding application) including at least 80 landings (5 at night).	
Helicopter Pilot	<p><i>Helicopter Pilot</i></p> <p>Proposals are under consideration for a Helicopter Pilot's Licence, but some time may elapse before this is introduced. In the meantime, the holder of a private or professional Pilot's Licence may have it endorsed for a particular type of helicopter, if the Ministry of Civil Aviation is satisfied that the applicant possesses the requisite qualifications.</p>	To fly helicopters according to type endorsement on pilot's licence.

OTHER LICENCES

The following licences will remain in force, but no substantial change in the qualifications to be met by candidates is proposed at present:—

Private Pilot (Balloons).

Commercial Pilot (Balloons).

Airship Pilot.

Aircraft Maintenance Engineer (Categories A, B, C, D, and X).

Helicopter Aviator's Certificate (issued by the Royal Aero Club).

APPENDIX E

ESTIMATE OF NUMBERS OF TRAINED PERSONNEL REQUIRED IN CIVIL AVIATION IN EACH YEAR FROM 1948 TO 1957 INCLUSIVE

NOTE ON ASSUMPTIONS MADE IN THE PREPARATION OF THE ESTIMATES

General

- (a) The estimates contained in the attached tables take account of the present restrictions on foreign travel.
- (b) To a large extent the estimates have been obtained from users. Where such estimates were unobtainable it was assumed that the numbers of skilled personnel employed in civil air transport would be roughly proportionate to the total aircraft hours flown, allowance being made for variation in the size and speed of aircraft and in the degree of aircrew utilisation. Use has been made of the results of an independent study of the future trend of the demand for the transport of passengers and freight by United Kingdom aircraft. From these results, taking into account the probable introduction of larger and faster types of aircraft, it is estimated that the number of aircraft hours flown in 1957 by the Corporations and charter operators will be approximately 140 per cent. and 200 per cent. respectively of those flown in 1950. This estimate has been applied, where necessary, to the individual categories in the paragraphs that follow.

2. Pilots

(a) Corporations

The figures have been obtained from the Corporations' estimates of their requirements for the next ten years. Although assessed independently, they accord with 1 (b) above in that they reflect an estimated increase of 40 per cent. in aircraft hours during the period 1950-57. The effect on pilot requirements has been offset by an expected greater pilot utilisation than that obtaining at present.

(b) Charter Companies

The figures have been based on the charter companies' estimates up to 1950. The factor of 2·0 (see paragraph 1 (b)) has been applied to the 1950 figure to obtain the 1957 figure, subject to a reduction of 25 per cent. for a possible rationalisation within the industry and greater pilot utilisation.

(c) R.A.F. Volunteer Reserve Schools

The figures have been based on information obtained from the Air Ministry.

(d) Flying Clubs

The figure for flying instructors as at 1st January, 1948, has been obtained from the Royal Aero Club. It has been assumed that there may be some reduction in the number of clubs by 1950, but that, assuming an appreciable improvement in the general economic situation in the United Kingdom during and after 1950, the number of personnel employed by clubs will be twice as great in 1957 as in 1948.

(e) Other Users

Allowance has been made to cover the various requirements of test flying, aerial work, training establishments, the Ministry of Civil Aviation, and Colonial requirements for United Kingdom personnel.

(f) Wastage

Eventually, the annual percentage of pilots who will need to be replaced because of retirement or for other reasons has been assumed to be 10 per cent. The percentage will at first be lower, since the present average age of pilots is lower than it would be in a period of stability.

3. Navigators

- (a) These are largely users' estimates. It has been assumed that the demand for staff employed solely as navigators will eventually decrease in proportion to the improvement and increasing production of radio and radar aids to navigation, and to the increasing trend towards combining the functions of first or second pilot and navigator.
- (b) It has been assumed that the annual wastage rate will be comparatively low initially and will gradually increase to 8 per cent.

4. Radio Officers

- (a) It has been assumed that the numbers required will be in proportion to the numbers of pilots up to about 1950, after which the requirement will decrease and become stable because of the improved simplicity and reliability of navigational aids and increased facilities for international communication by radio-telephony in the English language.
- (b) The same wastage rate has been assumed as for navigators (see paragraph 3 (b)).

5. Flight Engineers

- (a) These have been based on users' estimates predicting a slight increase up to about 1951 and stability thereafter.
- (b) Wastage has been based on users' estimates and is similar to the rate for navigators (see paragraph 3 (b)).

6. Aircraft Maintenance Engineers

- (a) These have been based partly on users' estimates and partly on a calculated relationship between the numbers of these engineers and of pilots. Account has been taken of the effect of the present economic situation on some types of flying activity. In the users' estimates, allowance has been made for an expected improvement in maintenance facilities, the introduction of aircraft designed for ease of maintenance and the use of gas turbine engines.
- (b) The wastage rate has been estimated at 6 per cent. annually, based on information obtained on the wastage rate in general engineering trades.

7. Aircraft Radio Maintenance Engineers

- (a) This estimate has been based on information supplied by users. It takes account of the expected increase in aircraft hours, and the differing requirements of aircraft and the routes concerned.
- (b) The wastage rate has been estimated at 6 per cent. annually.

8. Air Traffic Control Officers

- (a) The estimate has been based on information supplied by the Ministry of Civil Aviation and International Aeradio Ltd.
- (b) It has been assumed that the annual wastage rate will be very low initially and will increase to 5 per cent. ultimately.

9. Ground Radio Operators

- (a) The estimate has been based on information supplied by the Ministry of Civil Aviation and International Aeradio Ltd.
- (b) It has been assumed that the annual wastage rate will be very low at first, and will increase to 7 per cent. by 1957.

APPENDIX E

TABLE I
ESTIMATE OF TRAINED PERSONNEL REQUIRED FOR CIVIL AVIATION DURING THE YEARS 1948-1957 INCLUSIVE

	PILOTS	NAVIGATORS	RADIO OFFICERS	FLIGHT ENGINEERS	AIRCRAFT MAINTENANCE ENGINEERS	AIRCRAFT RADIO MAINTENANCE ENGINEERS	AIR TRAFFIC CONTROL OFFICERS		GROUND RADIO OPERATORS	
							*Annual Requirement	Total at end of each year	*Annual Requirement	Total at end of each year
1947	1,920	385	885	294	5,518	5,827	50	500	599	76
1948	150	42	100	67	695	6,102	52	540	100	699
1949	251	43	445	65	370	6,382	53	560	100	799
1950	2,431	56	482	45	411	6,659	54	580	45	836
1951	374	55	512	55	440	6,897	55	600	53	872
1952	316	51	530	46	459	7,142	56	620	51	896
1953	294	51	543	55	478	664	58	640	59	919
1954	301	55	554	54	495	670	59	640	59	977
1955	336	49	558	46	502	679	59	660	66	941
1956	373	49	560	48	509	687	60	680	69	963
1957	385	47	3,204	50	516	693	61	700	70	1,041
										118

* Note:—The figures in these columns include provision for both wastage replacements and net additions to existing establishments.

APPENDIX E

TABLE II

SOURCES OF FUTURE ENTRANTS INTO CIVIL AVIATION DURING THE YEARS 1948-1957 INCLUSIVE

	Pilots			Navigators			Radio Officers			Flight Engineers			Aircraft Maintenance Engineers			Aircraft Radio Maintenance Engineers			Air Traffic Control Officers			Ground Radio Operators			
	A			B			C			A			A			B			C			A			
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
1948	150	320	—	42	250	—	100	125	—	67	75	—	695	85	610	50	540	—	99	—	99	76	242	—	
1949	...	251	320	—	43	20	23	111	24	87	65	15	50	670	52	—	52	100	—	100	76	—	76		
1950	...	297	87	210	56	46	10	170	44	126	45	18	27	682	53	—	53	100	—	100	76	—	76		
1951	...	374	31	343	55	15	40	142	—	142	55	—	55	691	54	—	54	45	—	45	56	—	56		
1952	...	316	—	316	51	—	51	136	—	136	46	—	46	656	55	—	55	53	—	53	62	—	62		
1953	...	294	194	100	51	110	—	119	—	119	55	—	55	664	—	664	56	—	56	51	—	51	64	—	64
1954	...	301	157	144	55	90	—	105	37	68	54	28	26	670	—	670	58	—	58	59	—	59	77	—	77
1955	...	336	133	203	49	81	—	110	29	81	46	18	28	679	—	679	59	—	59	66	—	66	90	—	90
1956	...	373	134	239	49	82	—	111	26	85	48	18	30	687	—	687	60	—	60	69	—	69	104	—	104
1957	...	385	134	251	47	82	—	111	26	85	50	18	32	693	—	693	61	—	61	70	—	70	118	—	118

Key:

Column A—Estimate of total numbers of recruits (see Table I) required annually for civil aviation on the basis of the assumptions set out in this Appendix.
 Column B—Estimate of the numbers of ex-R.A.F. personnel who will enter civil aviation employment each year. It has been assumed that the maximum ages for entry will be 28 for *pilots* and 30 for *all other categories*. From information supplied by the Air Ministry regarding the percentage of personnel leaving the R.A.F. in 1947 who expressed a preference for employment in civil aviation, it has been assumed that, for the years 1948 to 1952, only 25 per cent. of those leaving the R.A.F. each year will be willing and suitable to be employed in civil aviation. For the years 1953 onwards when the pre-selection measures recommended in paragraphs 35 and 36 of the report may be expected to take effect, it has been assumed that the above-mentioned percentage will increase to 50 per cent.

Column C—The balance to be filled from other than ex-Service sources, i.e., by entrants direct from civil life.

APPENDIX F *

NOTE ON SALARIES, RATES OF PAY AND CAREER PROSPECTS IN CIVIL AVIATION

1. This Appendix has been prepared from information obtained from a number of authoritative sources in civil aviation. Many of the rates of pay have been the subject either of an Arbitration Court Award or of employer/employee agreement under the auspices of the National Joint Council for Civil Air Transport. Such rates are fairly stable, and this situation applies generally throughout the airline Corporations. The rates of pay in most of the charter firms, however, have not yet been similarly stabilised, partly because the postwar charter industry is still young, and partly because the personal character of some firms does not lend itself to hard and fast conditions of service. Care has been taken to ensure that the information is accurate, but there is no warranty that the rates quoted are paid in all companies. The figures are intended to give a guide to the general level of emoluments and to the higher posts that are open to employees in the various trades.

PILOTS

(a) Corporations

2. The following information has been supplied by the National Joint Council for Civil Air Transport and is based on an Industrial Court Award announced on 28th October, 1947. It governs the salaries and pensions of pilots employed by the three airline Corporations.

(i) Salaries

Second Officers	...	...	...	...	£600 \times £25—£700 per annum
First Officers	...	...	...	...	£750 \times £25—£900 per annum
Junior Captains	...	...	...	...	£1,000 \times £45—£1,180 per annum
Senior Captains, 2nd Class	...	...	...	...	£1,200 \times £50—£1,480 per annum
Senior Captains, 1st Class	...	...	...	...	£1,500 \times £50—£1,650 per annum

(ii) Overseas Allowance, (B.O.A.C. and B.S.A.A.)

1st and 2nd Officers	...	...	...	...	11s. per day
Captains	...	...	...	...	15s. per day

(iii) Travelling Allowance (B.E.A.)

6s. for each night away from base on service outside the United Kingdom and within Europe.

(iv) North Atlantic Pay

Between £225 and £300 per annum according to salary for pilots employed on the North Atlantic Routes, but not other transoceanic routes.

(v) Pilot Instructors

Basic pay plus an Instructor's Allowance at the rate of £416 per annum.

(vi) Pensions

For entry up to age 30:—

Retirement at age 40. £350 per annum rising by stages to

Retirement at age 50. £650 per annum.

Rates of employee's pension contribution to be determined by the employer and *to be added to the employee's salary* (i.e. the salaries quoted at 2 (i) above are *net*).

3. A limited number of senior, administrative and technical posts is open to pilots possessing the necessary qualifications and experience. The salaries for these posts range from about £750 to about £1,500 per annum, with a very occasional post carrying a salary up to £2,500 per annum.

(b) Other Companies

4. The salaries payable by other companies are, in general, the same as those for similar duties in the airline Corporations, though the actual basic rates, allowances and conditions of service vary from firm to firm.

FLYING INSTRUCTORS

5. The Guild of Air Pilots and Air Navigators has stated that the general level of flying instructors' salaries prevailing in flying clubs at present is between £450 and £600 per annum, and in R.A.F. Volunteer Reserve Training Schools it is between £600 and £850 per annum, frequently consisting of a basic annual salary plus flying pay on an hourly basis. Chief Instructors who have management responsibilities in the R.A.F.V.R. Schools receive between £900 and £1,200 per annum. If the economic situation of this country in general and of flying clubs in particular were to improve, there would probably be some increase in the emoluments of flying instructors.

* This statement is of conditions as they were at the 1st May 1948.

NAVIGATORS

(a) B.O.A.C. only. (Navigators are not at present employed by B.E.A. or B.S.A.A.).
6. The following figures have been supplied by the National Joint Council for Civil Air Transport.

2nd Navigating Officer	...	...	...	£608 × £25—£708 per annum
North Atlantic Pay (see para. 2 (iv))	...	...	...	£175 per annum
1st Navigating Officer	...	...	...	£708 × £25—£828 per annum
North Atlantic Pay (see para. 2 (iv))	...	...	...	£200 per annum.

7. A very few senior administrative and technical posts are open to Navigating Officers at salaries ranging from about £750 to about £1,500 per annum.

(b) Other Companies

8. The salaries payable outside the airline Corporations vary; the general level is approximately as follows:—

Navigating Officers	...	...	...	Between £600 and £750 per annum
Chief Navigating Officer (where employed)	...	...	...	£900 per annum.

RADIO OFFICERS

9. The following information has been supplied by the Radio Officers Union and the National Joint Council for Civil Air Transport:—

(a) B.O.A.C. and B.E.A.

Radio Officers	...	...	...	£495 × £25—£758 per annum
North Atlantic Pay (see para. 2(iv))	...	...	...	£150—£200 per annum according to salary

(b) B.S.A.A.

Radio Officer C	...	...	...	£500 × £25—£575 per annum
Radio Officer B	...	...	...	£600 × £25—£675 per annum
Radio Officer A	...	...	...	£700 × £25—£900 per annum

(c) Other Companies

The salaries vary considerably, the average being as follows:—
Radio Officers £500 × £25—£850 per annum.

10. A limited number of senior administrative and technical posts is available, mostly in the three airline Corporations, to Flight Radio Officers possessing the requisite qualifications and experience. The salaries vary according to the post, the range being between £750 and £1,500 per annum.

FLIGHT ENGINEERS

11. Information supplied by the National Joint Council for Civil Air Transport is as follows:—

(a) B.O.A.C. only

3rd Engineer Officer	...	...	...	...	£495 × £25—£608 per annum
North Atlantic Pay (see para. 2(iv))	...	...	...	...	£156 per annum
2nd Engineer Officer	...	...	...	...	£608 × £25—£708 per annum
North Atlantic Pay (see para. 2(iv))	...	...	...	...	£175 per annum
1st Engineer Officer	...	...	...	...	£708 × £25—£828 per annum
North Atlantic Pay (see para. 2(iv))	...	...	...	...	£200 per annum.

12. Particulars of senior posts open to Flight Engineers in the Corporations are given in paragraph 15 below.

(b) Other Companies

13. The rates vary, the average being as follows:—

Flight Engineers	...	...	...	...	Between £525 and £750 per annum
Engineer-in-Charge	...	...	...	...	Between £1,000 and £1,200 per annum.

AIRCRAFT MAINTENANCE ENGINEERS

14. The following information has been supplied by the National Joint Council for Civil Air Transport.

(The rates are exclusive of overtime and extra duty pay):—

(a) B.O.A.C., B.E.A., and B.S.A.A.

Semi-skilled workers: Between £4 18s. 1d. and £5 13s. 8d. according to experience in a trade capacity. (44 hour week on day work).

*Skilled workers**: 2s. 7d. per hour = £5 13s. 8d. for 44 hour week on day work.

The rates of pay of skilled workers may be augmented at the discretion of the employer by proficiency pay of $\frac{1}{2}$ d. per hour or multiples of $\frac{1}{2}$ d. up to a maximum of 3d. per hour.

Leading Hands: 2s. 10 $\frac{1}{2}$ d. per hour = £6 7s. 5d. for 44 hour week on day work, increased by $\frac{1}{2}$ d. per hour for each six months' satisfactory service as a Leading Hand to a maximum of 2s. 11 $\frac{1}{2}$ d. per hour = £6 11s. 1d. per week.

An allowance of 5s. per week is granted for each Maintenance Engineer's Licence held by Leading Hands and skilled workers.

Note. All the grades mentioned in this paragraph are in receipt of a provisional bonus of 3d. per hour, pending the introduction of an incentive bonus scheme.

15. Higher Posts, which may be regarded as the normal channel of promotion on the engineering side in the Corporations, are as follows:—

Inspector C	...	...	...	...	...	£7 3s. 0d. \times 5s.—£7 13s. 0d. per week
Inspector B	...	...	...	...	...	£7 18s. 0d. \times 5s.—£8 13s. 0d. per week
Inspector A	...	...	...	...	...	£8 16s. 0d. \times 5s.—£9 6s. 0d. per week

Chargehand B	...	...	...	...	...	£7 18s. 0d. \times 5s.—£8 13s. 0d. per week
Chargehand A	£8 16s. 0d. \times 5s.—£9 6s. 0d. per week

Section Inspector	£600 \times £25—£650 per annum
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Assistant Foreman	£600 \times £25—£650 per annum
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Foreman	£650 \times £25—£700 per annum
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Line or Works Inspector	£660 \times £30—£810 per annum
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Technical Assistant (Eng.):

Class III	£7 7s. 6d. \times 7s. 6d.—£9 5s. 0d. per week
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Class II	£480 \times £25—£555 per annum
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Class I	£580 \times £25—£630 per annum
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Technical Officer (Eng.):

Class II	£660 \times £30—£810 per annum
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Class I	£830 \times £50—£930 per annum
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Engineering Superintendent:

Class II	£830 \times £50—£930 per annum
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Class I	£980 \times £50—£1,080 per annum
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Planning Assistant:

Class II	£5 15s. 0d. \times 5s.—£7 0s. 0d. per week
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Class I	£7 7s. 6d. \times 7s. 6d.—£9 5s. 0d. per week
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Planning Engineer:

Class II	£480 \times £25—£630 per annum
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Class I	£660 \times £30—£720 per annum
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(b) Other Companies

16. At present the rates vary, but it is expected that within the next year or so they will be the same as those for similar duties in the Corporations.

AIRCRAFT RADIO MAINTENANCE ENGINEERS AND MECHANICS

17. The following information has been supplied by the National Joint Council for Civil Air Transport. (The rates are exclusive of overtime and extra duty pay):—

(a) B.O.A.C., B.E.A. and B.S.A.A.

Semi-skilled workers: Between £4 18s. 1d. and £5 13s. 8d. per 44 hour week on day work, according to experience in a trade capacity.

*Skilled Workers**: 2s. 7d. per hour = £5 13s. 8d. per 44 hour week on day work, with proficiency pay and provisional bonus as for Aircraft Maintenance Engineers (see para. 14).

Radio Engineers:

Grade B	£7 13s. 0d. \times 5s.—£8 8s. 0d. per week
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Grade A	£8 11s. 0d. \times 5s.—£9 1s. 0d. per week
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Radio Engineers-in-charge	£9 1s. 0d. \times 7s. 6d.—£9 16s. 0d. per week
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* Note. A worker shall not be classified as skilled unless he has served a recognised apprenticeship at his craft or trade and can produce written proof of same, or has gained experience of his craft or trade which is accepted by the employers and the appropriate craft union as being equivalent to the training of an apprentice.

18. The normal avenue of promotion is through the following grades:—

Signals Assistant	...	...	...	...	£405 × £25—£455 per annum
Signals Officer:					
Class III	...	...	...	...	£480 × £25—£555 per annum
Class II	...	...	...	...	£580 × £25—£630 per annum
Class I	...	...	...	...	£660 × £30—£720 per annum

(b) **Ministry of Civil Aviation**

19. The following information has been supplied by the Ministry of Civil Aviation for Radio Mechanics employed by the Ministry:—

Grade II	...	...	...	...	£5 5s. 0d. × 3s.—£6 0s. 0d. per 48 hour (net) week, plus War Duty Allowance of 10s. 0d. per week.
Grade I	...	...	...	...	£5 15s. 0d. × 3s.—£6 10s. 0d. per 48 hour (net) week, plus War Duty Allowance of 10s. 0d. per week.

Note: A claim for higher rates of pay is under consideration.

20. The normal avenue of promotion is to:—

Maintenance Overseer	£410 × £15—£500 per annum
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(c) **International Aeradio Ltd.**

21. The following information has been supplied by **International Aeradio Ltd.**:—

Radio Mechanics	£5 13s. 6d. × 5s.—£7 0s. 0d. per week
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(d) **Other Companies**

22. The position is the same as that of Aircraft Maintenance Engineers (see paragraph 16 above).

AIR TRAFFIC CONTROL OFFICERS

(a) **Ministry of Civil Aviation**

23. The following information has been supplied by the Ministry of Civil Aviation in respect of Air Traffic Control Officers employed by the Ministry:—

 Divisional Air Traffic Control Officer:

London Division	...	...	...	...	£1,150 × £35—£1,300 per annum
Other Divisions	...	...	...	...	£960 × £30—£1,100 per annum

24. The following rates are for employment in the London Area; elsewhere, the rates are slightly lower:—

 Air Traffic Control Officer:

Grade III	...	...	...	...	£360 per annum at age 23 rising to £520 per annum at age 28. £540 × £20—£650 × £25—£750 per annum for age 29 and over.
Grade II	...	...	...	...	£750 × £25—£900 per annum
Grade I	...	...	...	...	£900 × £30—£1,000 per annum

(b) **International Aeradio Ltd.**

25. The following information has been supplied by **International Aeradio Ltd.** in respect of its Air Traffic Control Officers:—

Grade III	...	...	...	...	£450 × £25—£600 per annum
Grade II	...	...	...	...	£600 × £30—£700 per annum
Grade I	...	...	...	...	£700 × £30—£850 per annum

GROUND RADIO OPERATORS

(a) **Ministry of Civil Aviation**

26. The following information has been supplied by the Ministry of Civil Aviation in respect of Ground Radio Operators employed by the Ministry:—

Grade II	...	...	...	...	£3 11s. 0d. (age 18)—£5 4s. 0d. (age 24) per week. £5 6s. 0d. × 3s.—£6 10s. 0d. (ages 25 and above) per week.
Grade I	...	...	...	...	£5 4s. 0d. (age 21)—£5 16s. 0d. (age 24) per week. £6 0s. 0d. × 5s.—£8 5s. 0d. (ages 25 and above) per week.

Supervisors receive the appropriate Grade I rate plus an allowance of 10s. or 15s. per week according to the degree of responsibility attaching to the post they hold.

Note: It is expected that the following increases will shortly be given:—

Grade II	...	...	...	...	...	Between 5s. and 11s. per week according to present rate.
Grade I	...	...	...	...	...	Between 5s. and 15s. per week according to present rate.

27. The normal avenue of promotion is to:—

Overseer—£450 \times £20—£525 per annum, plus War Duty Allowance of £25 per annum.
Negotiations for a higher salary scale are in hand.

(b) International Aeradio and B.O.A.C.

28. The following information has been supplied by the National Joint Council for Civil Air Transport:—

Ground Radio Operators:

Class II	...	...	...	...	...	£325 \times £13—£351 per annum
Class I	...	...	...	...	...	£364 \times £13—£390 per annum

plus Supervisory Pay of 10s. per week when acting as Ground Radio Operators-in-charge at a Station.

PENSION SCHEMES

The Airline Corporations

29. Information on pension schemes for Corporation pilots is given in paragraph 2 (vi) above. The National Joint Council for Civil Air Transport has stated that negotiations are well advanced for the introduction in B.E.A. and B.S.A.A. of pension schemes for all other categories of personnel mentioned in paragraph 4 of the report. Pension schemes for these categories are already in force in B.O.A.C.

Charter Companies

30. Some of the larger charter companies have already introduced or are introducing pension schemes for all or most of the categories dealt with in this report, including pilots. It is understood that consideration is being given to a scheme for aircrew employed by charter companies under which pension rights will be transferable in the event of a change of employer.

Flying Clubs and Training Schools

31. One or two of the largest training organisations have pension schemes for their employees, but very few, if any, flying clubs have been able to provide such benefits. It is understood that consideration is being given to a scheme for aircrew employed by clubs and training organisations under which pension rights will be transferable in the event of a change of employer.

LONDON

PRINTED AND PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

To be purchased directly from H.M. Stationery Office at the following addresses:

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